

WBS Element	Basis of Estimate
WBS 1-3: Proj. Mgmt, Sys Eng (incl. Mission Design), SMA	Cost-to-Cost Ratio Based on Flagship class missions
WBS 4: Science	Cost-to-Cost Ratio Based on Flagship class missions
WBS 5.1 Telescope Structure	Grass roots for labor, per unit non-labor estimates: \$10M
WBS 5.2 Telescope Optics	Grass roots for labor, per unit non-labor estimates: \$100M
WBS 5.3 Telescope Sunshade	Grass roots for labor, per unit non-labor estimates: 30% of labor
WBS 5.4 Instruments	CADRe based on analogues (HDI, ECLIPS, LUMOS, Pollux)
WBS 5.5 Robotics (2 arms)	Labor: Grass roots for labor, analogues (Gateway, Restore-L, RSGS, Mars), Non-Labor: estimate of \$100M per arm
WBS 6: Spacecraft	Grass roots estimate, \$1B, \$1.5B and \$2B for 3 sizes
WBS 7 & 9: MOS/GDS	Cost-to-Cost Ratio Based on Flagship class missions
Reserves	Consistent with A-Team (30%). Does not include LV and CDS,
WBS 8.1 Launch Systems	Input from NASA Launch Service Program (NLSII PPBE input)
WBS8.2 Cargo Delivery Vehicle	Grass roots estimate from analogues (Cygnus, Dragon)
Operations	\$80M/year assembly ops cost added to mission operations
Servicer	From Analogues (DARPA RSGS and Restore-L)
Tech Dev and Pre-Phase A	Did Not Estimate

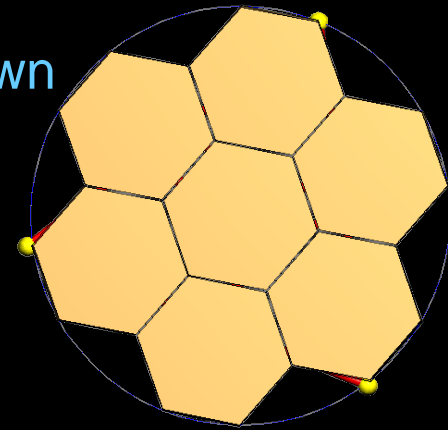
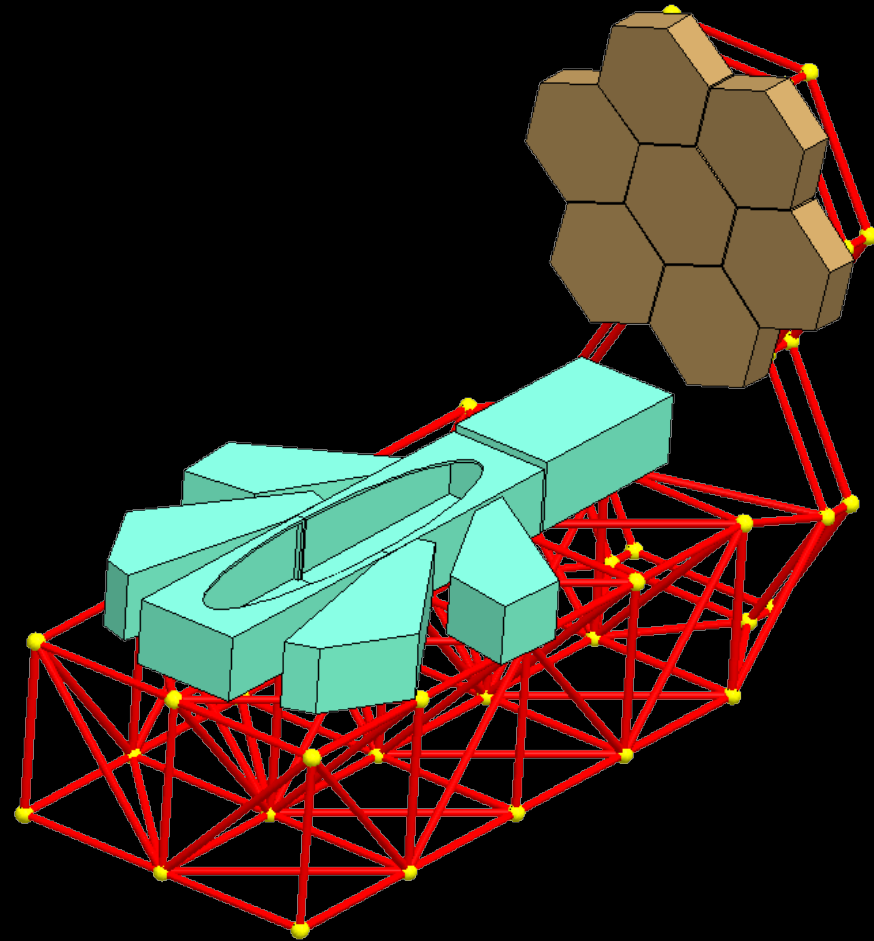
- Used \$500k per person per year for labor; unit modules for truss and optics shown in next slide
- Multiplied labor estimates by factor of **2** to account for optimism in grass roots i.e. **100%** margin for all three sizes
- Includes scaling effect with aperture size on non-labor costs, including materials
- Does not include learning curve for repeat modules

The cost information contained in this document is of a budgetary and planning nature and is intended for informational purposes only. It does not constitute a commitment on the part of JPL and/or Caltech.

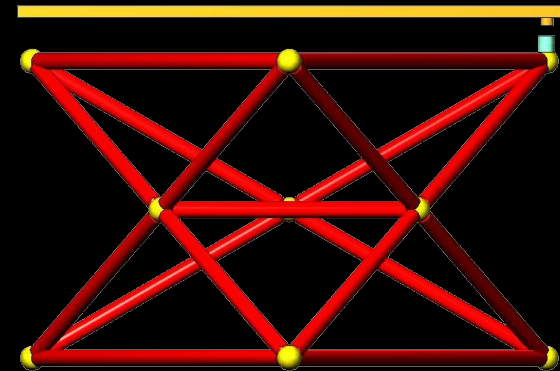
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What is a unit module?

Example of truss and optical unit module are shown



Unit Module for Optical Raft



Unit Module for Truss

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